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United States Government **Department of Energy**

memorandum

DATE: April 26, 2006

REPLY TO
ATTN OF: Office of Air, Water and Radiation Protection Policy and Guidance (EH-41):Natoli:6-1336

SUBJECT: Guidance for the Preparation of Department of Energy (DOE) Annual Site Environmental Reports (ASERs) for Calendar Year 2005

TO: Distribution

This memorandum provides the annual guidance for reporting under DOE Order 231.1A, *Environment, Safety and Health Reporting*, and Order DOE 5400.5, *Radiation Protection of the Public and Environment*. It updates previous guidance regarding the preparation, approval and release of the DOE ASERs, and is prepared to comply with paragraph I.2.b of DOE Manual 231.1-1A which requires the Office of Air, Water and Radiation Protection Policy and Guidance (EH-41) to issue annual guidance for the preparation of ASERs. EH-41 is recommending some format and content suggestions for the 2005 ASERs. These suggestions are consistent with discussions held at the last annual ASER workshop hosted by EH-41 at Los Alamos National Laboratory in October, 2005. They include:

- Discussing a site's Environmental Management System (EMS) elements, its effectiveness and implementation progress at the site and its status within the framework of the Department's Integrated Safety Management System (ISMS);

- Reporting on activities pursuant to Executive Order (E.O.) 13148, *Greening the Government Through Leadership in Environmental Management* and E.O. 13101, *Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition*;

- Discussing highlights or significant accomplishments of site pollution prevention activities, including progress in meeting the Department's (Secretarial) Pollution Prevention and Energy Efficiency Goals (November 1999), efforts to phase out Ozone Depleting Substances (ODS) and any DOE or other Federal Agency Pollution Prevention recognition awards received in 2005;

- Reporting of radiological doses and releases resulting from DOE facility operations;

- Reporting on radiation protection, including discussions on:

  - all site activities involving the control or release of real or personal property containing residual radioactive material, including the authorized limits used and associated resulting doses, and
  - protection of biota;

- Discussing a site's environmental performance measures program, including specific environmental performance measures applicable to operations conducted at the site;

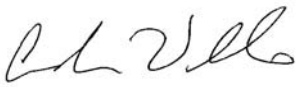
- Reporting of DOE Site-Wide Groundwater Monitoring Program results;

- Reporting suggestions for DOE Closure sites.

These suggestions are addressed in detail in the following attachments: **Attachment I**, *Supplemental Guidance for the Preparation of the 2005 Annual Site Environmental Reports*, **Attachment II**, *Suggested Formats for Radiological Dose and Release Reporting in ASERs*, **Attachment III**, A*ddressing Protection of Biota in ASERs*, and **Attachment IV**, *Suggested Reporting Format for DOE Site-Wide Groundwater Monitoring Program*. **Attachment V,** *ASER Reporting and Closure Sites*, provides reporting suggestions for DOE Closure sites. **Attachment VI**, *Site- Specific Examples of Suggested ASER Reporting Formats*, provides some noteworthy examples of ASER reporting formats, referenced from 2004 ASERs, that conform to EH-41 ASER guidance recommendations. These referenced examples illustrate effective reporting formats for: the executive summary, radiological doses and releases, biota dose evaluations, site-wide groundwater monitoring programs, environmental management systems, DOE Order 450.1, E.O. 13101, EO 13148, Emergency Planning and Community Right-To-Know (EPCRA), environmental performance measures, National Pollutant Discharge Elimination System (NPDES) exceedances and the ASER public/reader comment form.

The ASERs provide important information needed by DOE Headquarters to assess field environmental program performance and confirm compliance with environmental standards and requirements. They are also the means by which DOE sites demonstrate compliance with the radiation protection requirements of Order DOE 5400.5. The submittal of an integrated annual summary report is, therefore, necessary to demonstrate compliance with 5400.5 as well as DOE Order 231.1A. In addition, ASERs are an important means of conveying DOE's environmental performance to members of the public living near DOE sites and to other stakeholders. The calendar year 2005 ASERs should be prepared and made available to the public by October 1, 2006 and should also be submitted to Russell Shearer, Acting Assistant Secretary for Environment, Safety and Health (EH-1), at that time.

Thank you for your ongoing efforts and continued cooperation as we work together to maintain and improve the quality and consistency of the DOE ASERs. If you have questions regarding the attached guidance, please contact Ross Natoli of my staff (e-mail: Ross.Natoli@eh.doe.gov; telephone 202-586-1336) for more information. The attached guidance is also available via the Office of Environmental Policy and Guidance Internet Web site at http://tis.eh.doe.gov/oepa.



Andrew Wallo
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Deputy Administrator for Nuclear Nonproliferation
Associate Administrator for Infrastructure and Environment
Associate Administrator for Management and Administration

cc: Other Organizations

Hazardous Waste Remedial Action Program, (HAZWRAP)
Center for Environmental Management Information

Attachment I: Supplemental Guidance for Preparation of the 2005 Annual Site Environmental Reports

TABLE OF CONTENTS

Attachment I

Supplemental Guidance for Preparation of the 2005 Annual Site Environmental Reports

Background

This guidance provides recommendations for reporting that may be used to help supplement the requirements of DOE Order 231.1A, *Environment, Safety and Health Reporting* that are contractually applicable to DOE sites, and the requirements of Order DOE 5400.5, *Radiation Protection of the Public and the Environment.*

As stated in DOE Order 231.1A, the purposes of the Annual Site Environmental Report (ASER) are to present summary environmental data to:

- o Characterize site environmental management performance,
- o Summarize environmental occurrences and responses reported during the calendar year
- o Confirm compliance with environmental standards and requirements, and
- o Highlight significant facility programs and efforts.

Because this report is the principal document that demonstrates compliance with Order DOE 5400.5 requirements, and a key component of DOE's effort to keep the public informed of environmental conditions at DOE sites, ASERs should contain the most accurate and complete radiological and non-radiological monitoring data, and up-to-date compliance information for calendar year (CY) 2005. The ASERs should also highlight new site programs and initiatives, compliance successes, noteworthy practices, site environmental performance measures and/or performance indicators programs, and, if applicable, site assessments that occurred during CY 2005. Significant environmental issues and events that occurred in 2006 (up to the time of public distribution of the ASERs) may be noted and summarized with the release of the ASERs, as well.

Public Information Source

Consistent with the DOE's commitment to openness and public involvement in DOE operations, the ASERs should be prepared in a manner that addresses likely public concerns and solicits feedback from the public and other stakeholders on the site's environmental management performance and compliance. Some recent successful approaches illustrating this include:

(1) A summary pamphlet targeted for the general public or non-technical reader that accompanies the ASER. Some noteworthy examples include the 2004 ASERs for Nevada Test Site, Oak Ridge, Argonne National Laboratory-East (ANL-East), Brookhaven National Laboratory (BNL) and Hanford. Community involvement in preparing the summary pamphlet is

encouraged. The Oak Ridge and ANL-East sites have effectively involved local high schools in the preparation of these summary pamphlets in recent years.

(2) An executive summary within the ASER that concisely highlights site operations, characterizes site environmental management performance and compliance, and describes significant environmental issues and programs.

(3) Site-specific electronic, Internet or Web-based approaches that facilitate public outreach to, and feedback from, stakeholders on ASERs. Sites should consider providing a "hot button" on their Home Page to allow easy and direct access to ASERs.

Coordination and Production

Since most DOE Headquarters (HQ) Cognizant Secretarial Officers (CSOs) have empowered the Field to prepare, approve and release the ASERs, we recommend CSOs make commitments to Field elements regarding the time frames for CSO review and comment. All significant comments should be forwarded by the CSOs directly to the appropriate Field elements within this comment period.

The Office of Air, Water and Radiation Protection Policy and Guidance, EH-41, is available to provide advice regarding the preparation of the ASERs. However, EH does not have a formal review and comment role for ASERs.

DOE HQ comments should be addressed and incorporated, as appropriate, into the final draft of the 2005 ASERs. The 2005 ASERs should be approved by the Heads of Field Organizations (HFOs), or appropriate designee, submitted to Russell Shearer, Acting Assistant Secretary for Environment, Safety and Health (EH-1), and released to the public and/or placed on a site's Internet home page by October 1, 2006. Any additional significant environmental compliance issues, events, or noteworthy practices that emerge between the end of CY 2005 and the actual public distribution of the ASERs may be summarized in the transmittal memorandum releasing the ASERs to the public, or as a separate attachment. The public release of the 2005 ASERs should also include a statement by the HFOs, or appropriate designee, ensuring DOE's commitment to the validity and accuracy of the monitoring data.

Distribution

Upon CSO or HFO approval of the 2005 ASERs, Field elements are requested to provide **three** copies to Ross Natoli in EH-41; **one** copy to Ray Hardwick, Deputy Assistant Secretary for Facility Safety, EH-2; **one** copy to Patrice Bubar, Deputy Assistant Secretary for Corporate Performance Assessment, EH-3; **one** copy to Glenn Podonsky, Director, Office of Security and Safety Performance Assurance, SP-1; and, as appropriate, distribute additional copies to relevant CSOs, the

Attachment I

Office of Scientific and Technical Information, the Environmental Protection Agency, State agencies, and other agencies, organizations or individuals.

Goals and Content

A chief purpose of the ASERs is to document: the radiological and non-radiological condition of a site's environs, the effluents and emissions released from DOE operations, and noteworthy trends with regard to these releases and environmental conditions. ASERs should accurately portray the radiological monitoring programs, non-radiological monitoring programs and regulatory compliance information required by DOE Orders and other applicable Federal and State regulations and requirements. They should also describe the environmental impacts of DOE site operations. Where appropriate, the use of models and assumptions used to estimate releases and environmental conditions should be clearly documented.

ASERs are the primary reports documenting compliance with the public radiation protection requirements of Order DOE 5400.5. Therefore, a comprehensive description of each site's radiological environmental impacts and programs should be included. This information will be analyzed and aggregated into the *DOE Annual Summaries of Radiological Doses and Releases* reports that EH-41 prepares.

For non-radiological monitoring data in the ASERs, EH-41 recommends reporting: (1) the Superfund Amendments and Reauthorization Act (SARA) Title III or Emergency Planning and Community Right-to-Know (EPCRA) information, which is needed to complete the annual progress report on compliance with E.O. 13148, *Greening the Government Through Leadership in Environmental Management* (see **ENVIRONMENTAL NON-RADIOLOGICAL PROGRAM INFORMATION** and **COMPLIANCE SUMMARY** sections); and (2) site environmental performance measures information.

DOE Field elements are encouraged to report on their environmental performance indicators and/or performance measures programs and initiatives at their site, including the measures used, and the results of those measures. The measures should be summarized in the **EXECUTIVE SUMMARY** and detailed in the **ENVIRONMENTAL MANAGEMENT SYSTEM** chapter of the ASER.

Finally, to allow for public involvement and feedback in the ASER preparation process, sites are encouraged to attach/insert a questionnaire or reader comment form to the ASER which solicits public input on the current and future ASERs. This form should be placed inside the front cover of the ASER for maximum visibility and easy public access. This questionnaire or reader comment form could also be available electronically on the site’s website where the ASER is posted.

Attachment I

Suggested Format for Annual Site Environmental Reports

The ASERs should, to the extent possible, follow the reporting format described herein.

- Executive Summary,
- Introduction,
- Compliance Summary,
- Environmental Management System,
- Environmental Radiological Protection Program and Dose Assessment,
- Environmental Non-Radiological Program Information,
- Groundwater Protection Program and
- Quality Assurance.

ASERs should also include, as appropriate, a glossary of definitions and lists of acronyms, abbreviations, symbols, units of measure, and references. Sites may modify this format as long as the applicable requirements of DOE Order 231.1A and Order DOE 5400.5 are met.

EXECUTIVE SUMMARY

The **EXECUTIVE SUMMARY** should highlight (1) the purpose of the ASER, (2) major site programs*, (3) other key initiatives, including environmental performance indicators and/or performance measures programs, and (4) a brief description of the site's Environmental Management System (EMS) and its implementation status within the framework of DOE's Integrated Safety Management System (ISMS), as appropriate.

This section should include a summary of radiological releases and doses to the public resulting from site operations as well as non-radiological releases. The dose to the maximally exposed individual (MEI) as well as the estimated natural background radiation dose at the site should be mentioned here. If no radionuclides were released from the site, an affirmative/declarative statement should be made here. The **EXECUTIVE SUMMARY** should not simply repeat information found in the main

* If the primary remaining site mission is decontamination/decommissioning (D&D) and environmental restoration (clean-up), a brief statement discussing site historical operations and mission should be included here.

body of the report, and should be written in a manner understandable to the non-technical reader. This section should be concise, balanced and targeted at an audience who may not read the entire report.

INTRODUCTION

The **INTRODUCTION** should include the following general information: (1) site location, (2) general environmental setting, (3) site mission, (4) primary operations and activities at the site, and (5) relevant demographic information.

COMPLIANCE SUMMARY

The **COMPLIANCE SUMMARY** should be a separate chapter in the ASER. This chapter should summarize the site's CY 2005 compliance status for the following: (1) major environmental statutes and regulations; (2) environmental Executive Orders; (3) DOE internal environmental and radiation protection Orders, including DOE Order 450.1, *Environmental Protection Program*, Order DOE 5400.5, *Radiation Protection of the Public and Environment*, DOE Order 231.1, *Environment, Safety and Health Reporting*, and DOE Order 435.1, *Radioactive Waste Management*; (4) the Atomic Energy Act of 1954 (42 USC 2011 et seq.); (5) compliance and/or cleanup agreements (both in place and currently under negotiation); (6) environmental violations cited by regulators (including any fines and penalties assessed); (7) Notices of Violation, Notices of Deficiency, Notices of Intent to Sue, and other types of enforcement actions issued to the site (as defined in DOE O 232.1A, *Occurrence Reporting and Processing of Operations Information*); (8) any reportable occurrences that require notification to an outside regulatory agency; (9) any major issues, instances of noncompliance and corrective actions; (10) the status and results of any ongoing self-assessments and/or environmental audits; and (11) existing permits. These items are discussed in detail below.

To support DOE-wide environment, safety and health performance indicators initiatives, the Compliance Summary chapter should include a discussion of compliance and/or cleanup agreements in place at the site. This discussion should include the enforceable milestones completed versus the milestones that were scheduled for completion in CY 2005 pursuant to these agreements. Additionally, the **COMPLIANCE SUMMARY** should contain a summary table or brief narrative of applicable permits at the site.

When possible, quantitative information should be provided. For example, if underground storage tanks (USTs) have been removed from the facility, state the number of tanks that have been removed and the number of tanks that still remain on the site. The **COMPLIANCE SUMMARY** should not present the large volume of supporting data that are presented in other sections of the ASER, such as the **ENVIRONMENTAL RADIOLOGICAL PROTECTION PROGRAM and DOSE ASSESSMENT** and **ENVIRONMENTAL NON-RADIOLOGICAL PROGRAM** sections.

Additionally, references should be made to other sections of the ASER, as appropriate, to minimize redundancy.

COMPLIANCE STATUS

The compliance status with respect to applicable major environmental statutes, DOE Directives, and Executive Orders should be discussed, including, but not limited to:

Environmental Restoration and Waste Management

- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA);
- Superfund Amendments and Reauthorization Act (SARA);
- Resource Conservation and Recovery Act (RCRA);
- Federal Facilities Compliance Act (FFC Act);
- National Environmental Policy Act (NEPA);
- Toxic Substances Control Act (TSCA);
- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA).

Radiation Protection

- Order DOE 5400.5, *Radiation Protection of the Public and the Environment*;
- DOE Order 435.1, *Radioactive Waste Management*;

  This section should briefly summarize the site's progress in achieving compliance with DOE Order 435.1, and if applicable, its predecessor Order DOE 5820.2A. At a minimum, information on the wastes that are managed at the site (e.g., high level, low level, transuranic, etc.) and what type of waste management the site is performing (e.g., generation, treatment, storage, disposal, etc.) should be included. For those sites that are authorized to manage a low level waste facility, there should be a table or a listing of the status of each phase of the low level waste management process (e.g., performance assessment, composite analysis (PA/CA), closure plan, PA/CA maintenance program, disposal authorization statement, etc.) and a narrative description of the site's low level waste management program. Discussion of radioactive waste management activities can be included in the **ENVIRONMENTAL RADIOLOGICAL PROTECTION PROGRAM and DOSE ASSESSMENT** section.

o Atomic Energy Act of 1954 (42 USC 2011 et seq.).

Air Quality and Protection

o Clean Air Act (CAA);

This section should include a discussion of the compliance status of the site's air emissions, including criteria pollutants and hazardous air pollutants. This section should generally summarize air permit exceedances, notices of violation (NOVs), other air quality non-compliances and any CAA compliance agreements in place at the site. Any major events that occurred at the site in CY 2005 pertaining to CAA compliance should be specifically discussed. The section should also address whether a major source of air pollutants (as defined in 40 CFR Part 70.2) is present at the site, and include information on the identity of operations whose emissions contribute most substantially to the major source. Conversely, if the site does not have a major source, then this should be explicitly stated. Additional guidance for reporting of ozone depleting substances (ODS) is provided in the **ENVIRONMENTAL MANAGEMENT SYSTEM** section of this guidance (**Attachment I**, p.12).

o National Emission Standards for Hazardous Air Pollutants (NESHAPs) (40CFR Part 61, Subpart H-Emissions of Radionuclides);

The 2005 ASERs should describe the efforts to comply with the monitoring procedure requirements for the Subpart H radionuclide NESHAPs. For example, NESHAPs compliance agreement negotiations and other discussions with regulatory agencies, or applications for waivers should be noted. If sites are exempted from any requirements, the reasons for the exemptions should be stated.

Detailed reporting and discussion of the site's radiological Subpart H air emissions and doses should be included in the **ENVIRONMENTAL RADIOLOGICAL PROTECTION PROGRAM and DOSE ASSESSMENT** section of the ASER (refer to **Attachment I**, p.16 and **Suggested Formats for Radiological Dose and Release Reporting in ASERs,** Attachment **II**, p.24). Issues concerning the site's compliance status with radionuclide NESHAPs and NESHAPs specific radionuclide monitoring, should be discussed in this section.

Information on Subpart H compliance is also reported in the *Air Emissions Annual Reports* required by the EPA. Guidance for these reports, titled *Guidance for Preparation of 1990 Air Emissions Annual Report Under Subpart H, 40 CFR 61.94*, was issued by the Office of Environmental Guidance, EH-23 (now EH-41) (January 1991). The information provided in the 2005 ASERs should be consistent with the information reported in the 2005 Air Emissions Annual Report to

demonstrate compliance with the Subpart H requirements for 2005. Any significant differences between ASER and Subpart H air emissions and estimated doses should be clearly explained.

Water Quality and Protection

o Clean Water Act (CWA);

Sites are encouraged to report National Pollutant Discharge Elimination System (NPDES) and State Pollutant Discharge Elimination System (SPDES) data in the tabular form below identifying the permit type, number of regulated* outfalls in use at a facility, the total number of permit exceedances per outfall, the date corresponding to each exceedance, and monitoring parameters and/or constituents. Additionally, the number of samples taken, the number of compliant samples, and the facility's percent compliance for all measured samples should be provided. The exceedances, their causes, and the nature of the corrective actions should be described in summary form. Progress on implementing previous corrective actions should also be addressed.

A summary of all CY 2005 NPDES/SPDES permit exceedances or non-compliances should be provided in the following format.

NPDES/SPDES NON-COMPLIANCES*

Permit Type	Outfall	Parameter	# of Permit Exceedances	# of Samples Taken	# of Compliant Samples	Percent Compliance	Date(s) Exceeded	Description/ Solution

* Note: Radionuclides regulated under the Atomic Energy Act (AEA) are not subject to Clean Water Act (CWA) requirements. If the site has accepted or is using NPDES or SPDES permit values for radionuclides out of comity, the table in the text should include a footnote to indicate if there is a formal agreement in place that establishes the basis for their use.

Using this tabular format will allow the information to be easily identified and collected from the ASERs in a consistent manner, rather than having to make separate data requests annually to Field elements for site compliance history and the development and compilation of DOE-wide environmental performance measures initiatives.

Any analyses or reviews to select Best Available Technology (BAT) for radiological effluent control conducted to comply with Order DOE 5400.5 requirements may be discussed here if it is not summarized elsewhere in the radiation protection section of the report.

o Safe Drinking Water Act (SDWA)

Attachment I

Other Environmental Statutes

- Endangered Species Act (ESA);
- National Historic Preservation Act (NHPA);
- Migratory Bird Treaty Act.

  Include a statement on the number of migratory birds of each species intentionally taken during the conduct of any program, activity or action, including but not limited to banding, marking, scientific collection, taxidermy, and depredation control.

DOE Order 450.1, *Environmental Protection Program*.

- Pursuant to DOE Order 450.1, sites should describe their progress in implementing Environmental Management Systems (EMS) at all appropriate facilities and the integration of their EMS with the Integrated Safety Management System (ISMS), as appropriate. Sites were required to have an EMS in place by December 31, 2005.

  The following additional information should also be reported in ASERs and may be descriptive or quantitative, as appropriate to your site. This information will be included in DOE's annual report to the Environmental Protection Agency (EPA) detailing DOE's progress in implementing the requirements of E.O. 13148, *Greening the Government Through Leadership in Environmental Management*. The following information should be included:

  (1) The use of pollution prevention activities to achieve and maintain environmental compliance;

  (2) The results of site environmental compliance and/or EMS audits;

  (3) The progress in using environmentally beneficial landscaping practices, e.g., practices used after the significant wildfires at Los Alamos and Hanford; practices used after decontamination/decommissioning (D&D) activities at a site;

  (4) A summary of site's progress in meeting the *DOE Secretarial Pollution Prevention and Energy Efficiency Goals* (November 1999) and progress of site's efforts to phase out use of Ozone Depleting Substances (ODS). Data to be reported includes reductions in the generation of hazardous waste, low-level radioactive waste, mixed waste, and transuranic waste. Accomplishment Reports are available on pollution prevention (P2) projects that saved money and/or reduced waste. All of this data can be

aggregated by site or CSO. The CY 2005 data are already available for downloading at EH's Pollution Prevention web site at www.eh.doe/p2. These data are also included in the Department's corporate annual progress report on E.O.13148 which was provided to the EPA and the Council on Environmental Quality (CEQ) in March 2006.

Executive Orders

o E.O. 13148, *Greening the Government Through Leadership in Environmental Management*:

E.O. 13148 supersedes E.O. 12856, *Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements*. However, E.O. 13148 maintains requirements for SARA Title III, Emergency Reporting and Community Right-to-Know Act (EPCRA) compliance and Toxic Release Inventory (TRI) reductions. The ASER should include summary information on the site-specific chemical inventory and toxic release inventory and should reference the site's submission to the EPA.

E.O. 13148 requires all Federal facilities to comply with EPCRA provisions (see below) once certain thresholds are met. Those EPCRA reporting requirements that were completed, or will be completed by your facility for CY 2005 should be indicated and discussed. If your site reported under the provision, indicate "yes." If your site should have reported under the provision, but did not, indicate "no." If your site was not required to report under a provision (e.g., did not meet the threshold, did not have an extremely hazardous substance (EHS) release, etc.), indicate "not required." A short table is provided below to assist you in presenting this information:

Status of EPCRA Reporting

EPCRA Section	*Description of Reporting*	*Status**
EPCRA Sec. 302-303	Planning Notification	
EPCRA Sec. 304	EHS Release Notification**	
EPCRA Sec. 311-312	MSDS/Chemical Inventory***	
EPCRA Sec. 313	TRI Reporting	

* An entry of "yes", "no", or "not required" is sufficient for "Status"
** Extremely Hazardous Substance
*** Material Safety Data Sheet

- o E.O. 13101, *Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition*. A summary of your site's recycling and affirmative procurement activities should be included here. Again, the data for 2005 are already available on EH's Pollution Prevention website at www.eh.doe/p2. These data are also included in the Department's corporate annual progress report on E.O.13101 which was provided to EPA, the Office of Management and Budget (OMB) and CEQ in February, 2006.

- o E.O. 11988, *Floodplain Management*;

- o E.O. 11990, *Protection of Wetlands*.

Any other major statutes or Executive Orders applicable to the site should also be included in the Compliance Summary chapter. If a major statute is not applicable, it should be listed with the notation "Not Applicable," with a short explanation as to why it is not applicable.

OTHER MAJOR ENVIRONMENTAL ISSUES AND ACTIONS

This section should identify other significant issues and accomplishments for CY 2005. For example, issues such as lawsuits, notices of violation (NOVs), alleged violations, environmental occurrences, non-routine releases, unresolved compliance issues and NEPA actions not previously presented should be addressed.

Summaries of DOE environmental audits, progress assessments or program appraisal findings and follow-up actions should be provided in this section. Publicly-available documents that can be referenced for additional information should be cited.

CONTINUOUS RELEASE REPORTING

Continuous Release Reporting under CERCLA Section 103 requires that a non-permitted hazardous substance released in a quantity that is equal to or greater than its reportable quantity be reported to the National Response Center (55 FR 30166, July 24, 1990). CERCLA Section 103(f) allows for modified reporting of releases of hazardous substances that meet certain criteria. The EPA requires all facilities that release a hazardous substance meeting the above requirement to report annually to EPA. The regulations include a requirement for an annual evaluation of releases. Summaries of this evaluation should be included in the ASER. Continuous release reporting not characterized or discussed in the **UNPLANNED RELEASES** section should be reported separately in this section.

UNPLANNED RELEASES

Summary information on significant, non-routine releases of pollutants or hazardous substances, including causes and corrective actions taken to prevent their recurrence, should be discussed here, especially as it pertains to facility operations, waste handling programs, and emergency response programs. The 2005 ASERs should discuss unplanned radiological and non-radiological releases in effluent, such as spills and leaks, whether on-site or off-site. This discussion should include releases reported as unusual or off-normal occurrences under DOE Order 232.1A. Releases reported to the Headquarters Emergency Operations Center and releases reported to the Coast Guard National Response Center should be summarized. The protective action recommendations implemented (if applicable) to mitigate the effects of the occurrences should also be discussed.

Consistent with the section regarding **UNPLANNED RADIOLOGICAL RELEASES** (**Attachment I**, p.21), this section of the ASER should also clearly state the bases for any scientific judgments regarding the magnitude of potential impacts of releases, in terms that the non-technical reader can easily understand.

A table or discussion should also be provided that includes the date each release occurred, the amount of material released, an explanation of the release, and corrective actions taken.

Generalized statements such as "no significant off-site effects occurred" or "doses were small" should be avoided. If such statements are necessary, release information should be compared to known values, e.g., small relative to applicable dose limits or to doses received from natural background at the site (include the numerical value for this dose). This approach ensures that the ASER clearly states the bases for any scientific judgments regarding the magnitude of potential impacts of releases in terms that the non-technical reader can easily understand.

SUMMARY OF PERMITS

This section should provide a table of the numbers and types of environmental permits for the facilities at the site.

ENVIRONMENTAL MANAGEMENT SYSTEM

According to the objectives of DOE Order 450.1, DOE sites should implement sound stewardship practices that are protective of the air, water, land, and other natural and cultural resources potentially impacted by their operations. Through these practices, DOE cost-effectively meets or exceeds compliance with applicable environmental, public health and resource protection laws, regulations and DOE requirements. These objectives should be achieved by implementing an Environmental

Management System (EMS) at DOE sites that is integrated into the Integrated Safety Management System (ISMS) established by DOE P 450.4, *Safety Management System Policy*.

Since Executive Order 13148 and DOE Order 450.1 require DOE sites to have an EMS in place by December 31, 2005, this section should include a discussion of the EMS implemented at the site. Although several recognized EMS frameworks exist, most are based on the International Organization for Standardization (ISO) 14001 EMS standard. This discussion should appropriately include a description of significant site EMS elements such as:

- The site's Environmental Policy
- Environmental Aspects and Impacts
- Legal and Other Requirements
- Environmental Objectives, Targets and Programs
- Pollution Prevention and Waste Minimization
- Resources, Roles, Responsibilities and Authorities
- EMS Competence, Training and Awareness
- Communication and Community Involvement
- Environmental Documentation
- Control of Documents
- Operational Control
- Emergency Preparedness and Response
- Monitoring and Measurement
- Evaluation of Compliance
- Nonconformity and Corrective and Preventive Actions
- Control of Records
- Internal Audit
- Management Review

The Office of the Federal Environmental Executive (OFFE) tracks federal agencies' progress in implementing EMSs through use of an annual scorecard. This scorecard has included metrics to measure site-level progress in implementing EMSs. These metrics are provided to allow agencies and facilities that are implementing an EMS to plan for effective reporting of EMS progress, performance and successes. To support DOE's reporting requirements under E.O. 13148 and DOE Order 450.1, DOE has adopted these metrics. This information will also assist DOE leadership in assessing the Department's progress in implementing EMSs at DOE facilities.

The 2005 ASERs should include a discussion which qualitatively describes the status of your site's EMS during calendar year 2005 regarding the following EMS metrics:

- Site has issued an EMS Policy Statement

Attachment I

- Site has provided EMS implementation training to the personnel establishing the EMS
- Site has identified its significant environmental aspects
- Site has established and documented measurable environmental objectives and targets
- Site has established environmental management programs specifically to achieve each of its environmental objectives and targets
- Site has developed a program for EMS awareness training
- Site has a formal ongoing program in place to conduct facility-wide EMS awareness training
- Site has established all EMS procedures (e.g., objectives and targets, environmental aspects and impacts, corrective action, self-assessment, management review)
- Site has an EMS in place and has completed the Self-Declaration Protocol in accordance with agency policy or have obtained third-party certification (i.e. ISO 14001 or National Environmental Performance Track)
- DOE Operations/Field/Site Office Manager Report Letter submitted pursuant to DOE Order 450.1 §5.d.(1) (i.e. the site's conformity declaration letter)

In this discussion, sites should not only describe their progress in implementing the EMS, but also summarize how their EMS has been successfully integrated into their site Integrated Safety Management System (ISMS) pursuant to DOE Order 450.1.

To the extent possible, sites should also describe the effectiveness of the EMS since its inception at the site. This should encompass the following:

- The impact of the EMS on the facility including: reduced risk to facility mission, improved fiscal efficiency and or cost avoidance, greater understanding and recognition of environmental issues at all levels of the organization, empowerment of individuals to contribute to the betterment of the organization's environmental footprint, integration of environment into organizational culture and operations, integration of environment into real property asset management, and improved community relations and/or cooperative conservation.

- The impact of the EMS on the environment and environmental issues including: improved overall compliance management, personnel health and safety, pollution prevention, improved air, water and land quality, improved hazardous material, hazardous waste and solid waste management, improved conservation of natural resources, energy and fuel and reduced environmental burden (e.g. number of permits needed to operate)

For the 2005 and future ASERs, sites should also discuss pertinent feedback from their EMS implementation experiences. This should include: the benefits and successes associated with EMS implementation at the site, EMS best practices and lessons learned, EMS challenges and identification of barriers to EMS implementation (including plans for resolution where appropriate), and how EMS implementation has enabled the site to operate more effectively in accomplishing its public missions.

Other significant environmental protection programs, as part of your EMS such as site meteorology, monitoring and surveillance, groundwater protection and monitoring, environmental restoration and waste management, and effluent monitoring should be described here, as well. This section should also summarize the monitoring and surveillance data in the **ENVIRONMENTAL RADIOLOGICAL PROTECTION PROGRAM and DOSE ASSESSMENT** and **ENVIRONMENTAL NON-RADIOLOGICAL PROGRAM** sections of the ASER.

To further demonstrate adherence to the requirements of DOE Order 450.1 and the reporting requirements in DOE Order 231.1A, this section should also briefly describe the major environmental programs ongoing at the site. For example, discussion of a site's initiatives, such as efforts to improve water quality through collaborative approaches to watershed management with States, Tribes, local governments, industry, other Federal Agencies and interested stakeholders, should be included in this section, as appropriate.

Special environmental studies conducted, or in progress, at a particular site should be discussed here. Redundancy with information presented in the **COMPLIANCE SUMMARY** and other sections of the ASER should be avoided. Additionally, pertinent information may be presented on other significant environmental activities at the site which are not adequately covered in other sections such as environmental training programs.

ENVIRONMENTAL PERFORMANCE MEASUREMENT

Environmental performance measurement is an integral component of an EMS. This section should discuss facility environmental performance measures and/or performance indicators programs implemented at the site. This discussion should include specific environmental performance measures applicable to operations conducted at the site, the results of those measures, a comparison of recent years' performance, and measures or goals planned for the future.

Site pollution prevention and waste minimization highlights or significant accomplishments should be mentioned here, including Return-On-Investment (ROI) programs that have been instrumental in advancing progress in meeting the *DOE Secretarial Pollution Prevention and Energy Efficiency Goals* (November 1999). A summary of waste reduction and recycling goals that were met or exceeded in the calendar year should be indicated here, as well. For example, a site avoided the generation of "X" pounds of waste which resulted in a savings of "Y" dollars in in treatment and disposal costs.

Progress on meeting E.O. 13148 requirements to achieve ODS reductions at sites should also be discussed. This discussion may include how sites are maximizing the purchase and use of safe, cost effective and environmentally preferable alternatives to ODS, an evaluation of the present and future uses of ODS at the site, and any exemplary practices developed and used at

a site. A description of a site's plan to phase out the procurement of Class I ODS* for all non-excepted uses by December 31, 2010, should be briefly discussed here, as well. In addition, a short description of a site's coordination efforts with the Department of Defense prior to off-site disposal or transfer of material containing ODS could be included here, if applicable to your site.

* Class I ODS are those chemicals listed in Appendix A to subpart A of 40 *CFR* Part 82 that cause or contribute significantly to harmful effects of the stratospheric ozone layer. Section 602 of the Clean Air Act directs EPA to add to the Class I list any chemical that EPA determines has an ozone depletion potential of 0.2 or greater.

AWARDS AND RECOGNITION

Sites should also highlight and discuss any DOE or other Federal Agency Pollution Prevention recognition awards received in CY 2005 (e.g., the President"s Closing the Circle Award), as well as State or industry sponsored environmental awards or recognition.

ENVIRONMENTAL RADIOLOGICAL PROTECTION PROGRAM and DOSE ASSESSMENT

This section should describe the radiological monitoring program at the site as well as all dose assessments conducted during the year. This information should address details on the models and assumptions used in performing the dose calculations, and any new monitoring data, as appropriate. If data are reported consistently at DOE facilities, it will greatly assist EH-41 efforts to compare data from facility to facility and to meaningfully aggregate the information in the preparation of the *DOE Annual Summaries of Radiological Doses and Releases* reports. Past summary reports for calendar years 1990-1994 and 1998-2001 can be accessed on the Office of Environmental Policy and Guidance Internet Website at http://tis.eh.doe.gov/oepa.

RADIOLOGICAL DISCHARGES AND DOSES

The following data should be presented in tabular form:

o Maximum Individual Dose (maximum effective dose equivalent as defined in Order DOE 5400.5) in units of millirem (mrem) and millisievert (mSv)[1], and Collective Population Dose (effective dose equivalent) in units of person-rem (person-Sv)[2] and total population within

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(1) Per Order DOE 5400.5, radiation doses should be expressed in units of mrem followed by the Standard International (SI) unit (mSv) in parentheses. The same is true for person-rem (person-Sv) and Ci (Bq).

(2) Estimates of collective dose for DOE facilities are required by Order DOE 5400.5. DOE has no de minimis level for these calculations.

80 kilometers (km)[3].

- o A comparison of the maximum individual dose with DOE, EPA or other standards, and with the natural background at the site.

- o Radionuclides released to the air during the year in units of curies (Ci) and becquerels (Bq), and radionuclides released to the water in units of Ci (Bq)[4].

Totals by radionuclide released and the half-life of each of the radionuclides reported should be given. Gaseous releases, liquid releases to surface waters and soils, and environmental measurements of air, surface water, soil, and foodstuff should be reported in appropriate units. Doses should be calculated following the requirements in Order DOE 5400.5 and comparisons should be made to standards in effect during 2005[5]. Where appropriate, the ASER should state that, because the doses are calculated rather than measured, they represent potential or estimated rather than actual doses[6]. Data should also be presented using scientific notation (e.g., 3.2×10^{-3} for 0.0032), where appropriate. The number of significant figures should also be appropriate to the

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(3) In certain instances, populations outside of the region of the 80 km radius may be affected by releases to that region. For example, in a predominantly agricultural area, more foodstuffs may be grown than are assumed to be consumed by the resident population. In such cases, the difference should be assumed to be consumed outside the region, and the resulting collective dose should be estimated and reported. Similarly, if a major drinking water system is located beyond the 80 km distance, but the input for that system receives the majority of liquid discharging from this site, it should be evaluated. In some situations, collective dose estimates address a specific group other than the 80 km populations. In such situations, the populations used to support the calculations should be described.

(4) Uranium releases should be reported in terms of both Ci (Bq) and grams.

(5) In particular, the total dose in terms of the dose from external exposures plus the 50-year committed effective dose from intakes of radioactive material should be calculated and reported.

(6) To demonstrate compliance with standards when the sources are extremely small, the dosimetry models and evaluations are sometimes selected to be very conservative and simplistic. When this is the case, it should be so stated, and where possible, a qualitative discussion should be included that describes the level or magnitude of conservatism.

quality of the data.

Attachment II provides a suggested format for radiological dose and release reporting. This reporting should depict an accurate portrayal of all radionuclides present at a site and their actual releases. In the reporting of atmospheric and liquid effluent releases, some radionuclides may not be applicable to certain DOE sites. If this is the case, indicate "NA" in the tables in **Attachment II**. In addition, a statement should be made confirming that all known radionuclides released in significant quantities from the site are documented in the ASER. It is noted that the format suggested in Tables 2 and 3 of **Attachment II** is to simplify the preparation of composite summary reports. They are not intended to replace site-specific-based presentations of data. A site-specific example from the 2004 West Valley Demonstration Project ASER is referenced in **Attachment VI.**

For compliance with the radiological emission standards in 40 CFR Part 61 (NESHAPs), promulgated December 15, 1989, the ASERs should report doses in terms of effective dose equivalent, calculated using the AIRDOS/CAP-88 or other EPA-approved air dispersion model, and compared to the 10 mrem per year air emission standard for DOE under Subpart H. Compliance with DOE public dose limits is also evaluated in terms of effective dose equivalent. Compliance with the emissions limits in Subparts Q and T should be discussed for those facilities subject to the specific requirements in 40 CFR Part 61. If a facility uses another air dispersion model deemed to be more site-specific than AIRDOS/CAP-88 to calculate potential dose for compliance with DOE requirements, that information should be included and distinguished from the NESHAPS compliance dose.

The dose to the maximally exposed individual (MEI) should be a conservative, but realistic, estimate based on a scenario that approximates an actual situation. The estimate should be reasonable but not likely to underestimate the MEI dose. Calculation of the dose to a person spending 100% of his time at the fence line is useful for comparison purposes, but it overestimates the dose to the most exposed individual and biases comparative analyses. The 2005 ASERs should contain estimates based on realistic situations and should clearly describe the location of critical receptors and the scenarios used to calculate the estimated doses.

For cases in which monitoring data are below minimum detectable levels, those minimum detectable levels should be specified and, as noted in the *Environmental Radiological Monitoring* section of this guidance, should be reported consistent with DOE/EH-0173T guidance regarding the use of "less than" values.

The text associated with the tables should address the primary contributors (the radionuclides and processes creating them) to the doses and should identify the models and any pertinent assumptions used in estimating the doses. For example: "The maximum effective dose equivalent for a member of the public was estimated to be 5 mrem (0.05 mSv) from all pathways. This was principally from Cs-137 and Sr-90 airborne emissions from [facility/process] and was calculated using AIRDOS-

EPA/RADRISK." If more than one radionuclide is a major contributor to the dose, a pie chart representing the relative contributions would be useful. If the maximum dose through the water borne pathway and the air borne pathway is to different individuals, the report should briefly explain why these doses are not additive.

Order DOE 5400.5 requires estimated reporting of collective doses to the public around DOE sites as well as radiation doses to MEIs. Estimates of doses to individuals should include multiple exposure pathways and releases from multiple sources (e.g., point and diffuse) if they contribute to the dose to the same individuals. The collective dose should be an integration of estimates of average or representative doses to the public, not maximum potential doses.

RELEASE OF PROPERTY CONTAINING RESIDUAL RADIOACTIVE MATERIAL

DOE's radiation protection framework and dose limits are centered around an "all sources and all pathways" philosophy. In addition to air and water discharges to the environment, the release of property (real or personal) containing residual radioactive material is another type of "release" to the environment and is a potential contributor to the dose received by the public. Specific authorized limits are used to govern the radiological release of sites, structures, and materials. As such, authorized limits for releases of property should be reported. It may be desirable to discuss real property (lands and structures), and personal property (equipment and soils), separately. The information regarding authorized releases should be summarized. This guidance is not intended to be prescriptive. These recommended reporting elements should be used in a way that best fits the format and style of each site's ASER.

However, the ASER should contain a summary of authorized limits for the site, including (a) the approved authorized limit used for releases, the rationale for its derivation, (e.g., dose/As Low As Reasonably Achievable (ALARA)-based or DOE approved surface activity guidelines) and its date of approval or effective date; and (b) the type of material or property (e.g., open land, structures, material and equipment, or laboratory waste), the basis for its release, and its expected end-use scenario (e.g., disposal; recycle; reuse). If the release of property is for recycle or reuse purposes, any discussion of these activities in this section may be referenced in the pollution prevention/waste minimization section, as well.

With regard to personal property release and considering the guidance contained in the January 19, 2001, memorandum from the Secretary, *Managing the Release of Surplus and Scrap Materials*, it may be desirable to provide summary data to quantify property released under the authorized limits or subject to the authorized limits. Where practical, information should be provided on (a) the volume, radionuclide concentrations, and total activity of the material; (b) the maximum dose to an individual, and collective dose estimates; and (c) the estimated cost savings and other benefits from the release or a qualitative discussion of the benefits of the release program. The ASER should include a brief discussion on any actions taken to implement the improvements to monitoring,

documenting and coordinating releases recommended in the memorandum. The ASER should also include the locations or methods by which interested parties could obtain more detailed data on releases (e.g., reading rooms, records centers or other locations where certification and release data are publicly available).

Requirements for the selection and approval of authorized limits are contained in Order DOE 5400.5. Guidance on the development and approval of authorized limits is provided in several supporting DOE radiation protection guidance documents which are available on line at http://tis.eh.doe.gov/oepa.

ADDRESSING PROTECTION OF BIOTA IN ASERS

Dose Limits for Protection of Biota and Methods for Demonstrating Compliance

DOE Order 450.1 (2003) requires that as part of integrating Environmental Management Systems (EMSs) into site Integrated Safety Management Systems (ISMSs), DOE elements must, as applicable, consider protection of biota. Both aquatic and terrestrial evaluations should be conducted. Order DOE 5400.5 (1991) requires that populations of aquatic organisms be protected to a dose limit of 1 rad/day. Recommended dose limits of 1 rad/day for terrestrial plants and 0.1 rad/day for terrestrial animals are to be applied in the evaluation of terrestrial systems. The DOE Technical Standard, *A Graded Approach for Evaluating Radiation Doses to Aquatic and Terrestrial Biota*, (DOE-STD-1153-2002) is available for use in the evaluation and reporting of compliance with both aquatic and terrestrial biota dose limits.

The RESRAD-BIOTA Code as a Tool for Evaluating Doses to Biota

The RESRAD-BIOTA code provides a complete spectrum of biota dose evaluation capabilities, from general screening, to comprehensive receptor-specific dose estimation. The code was principally sponsored and developed by DOE, with support from the Environmental Protection Agency and Nuclear Regulatory Commission. The code was released in September 2003; a User's Guide was published in January 2004. An updated version (1.2) of the code containing an expanded radionuclide database and advanced features was released in March 2006. The RESRAD-BIOTA code was designed to be consistent with the DOE graded approach to biota and the method's Biota Concentration Guides. The RESRAD-BIOTA code is recommended as the preferred companion software tool to the Technical Standard for demonstrating protection of biota in your ASERS.

DOE Technical Standard DOE-STD-1153-2002, the RESRAD-BIOTA code, and the RESRAD-BIOTA code User's Guide (DOE/EH-0676; ISCORS Report 2004-02) are available from DOE's Biota Dose Assessment Committee (BDAC) Web Site (http://homer.ornl.gov/oepa/public/bdac). Refer to **Attachment III** and **Attachment VI** for specific details and site-specific examples for demonstrating and reporting compliance with dose limits for biota in your ASER.

Attachment I

UNPLANNED RADIOLOGICAL RELEASES

Doses associated with unplanned releases should be reported. If the doses associated with unplanned releases are insignificant with respect to normal release-related doses (i.e., a few percent or less), they should be reported as such. If they exceed appropriate limits, this should also be noted.

ENVIRONMENTAL RADIOLOGICAL MONITORING

In the 2005 ASERs, facilities are requested to provide information on the models and assumptions used in reporting these data so that the data may be consistently and usefully aggregated. The "background" radiation levels used for comparison with off site monitoring results, and the locations at which the background levels were measured, should be clearly stated. Summaries or tables of measured concentrations or activity should follow the guidance in § 7.3.4 of DOE/EH-0173T, *Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance*, January 1991, page 7-5, regarding the use of "less than" values in reports and averages.

ENVIRONMENTAL NON-RADIOLOGICAL PROGRAM INFORMATION

This section discusses the inclusion and display of non-radiological monitoring information in ASERs. When reporting non-radiological monitoring data, detection limits should be specified, where appropriate.

Non-radiological monitoring data should be included to provide a comprehensive summary of the environmental impacts associated with DOE site operations and the environmental monitoring efforts underway at DOE sites. Examples of the types of information that should be included and discussed in the 2005 ASERs, if the data are available, are described below.

Graphical displays of non-radioactive emissions in addition to air and water discharges should be used in demonstrating compliance with applicable permit limits. For example, graphs can show that, when a permit contains both daily and annual release limits, exceeding the daily limit may not necessarily constitute a compliance problem with respect to the annual limit.

Monitoring data related to non-radiological gaseous or liquid emissions for which there are applicable standards or other meaningful bases for interpreting the results should also be included in this section.

The Federal and State regulatory limits applicable to the site's emissions should also be described. Where appropriate, interpretation should be made of how the environmental pollutant discharge levels (resulting from site operations) compare to relevant parameters such as background levels and applicable effluent or environmental standards.

Attachment I

GROUNDWATER PROTECTION PROGRAM

This section should provide a brief description of site hydrological conditions, including cross-sections of subsurface conditions at the site. Reference to additional technical documents detailing the hydrological conditions, including groundwater flow and potential receptors, should be provided here as well.

Groundwater monitoring and public drinking water protection continue to receive emphasis at EPA and within DOE. This section should include data on facility up-gradient and down-gradient wells at RCRA hazardous waste units, DOE Radioactive Waste Management Units, RCRA or CERCLA remediation sites, and identified compliance points (i.e., points at which regulatory standards apply) to effectively track groundwater plume movement. Groundwater monitoring wells operated for other purposes should also be included. These monitoring wells would include subsurface or aquifer characterization wells (used for environmental surveillance), environmental radiological program monitoring wells, or wells operated for detection monitoring at non-RCRA and non-CERCLA facilities at the site.

To make the ASERs more meaningful, trends in the groundwater data over time should be included. Each site should prepare tables to indicate trends in groundwater plume movement over a 5-year period, at a minimum. Data for the current year and for the previous five years should be displayed graphically or presented as basic statistics (such as median values and ranges) for contaminants commonly detected at the site. The real or potential impact of groundwater plume and contaminant movement on public drinking water supplies should be discussed here. The 2005 ASERs should characterize groundwater monitoring results for CY 2005 and for the five previous years if the data are available. In addition, the ASERs should highlight monitoring wells with significant changes in contamination indicator parameters above background levels. This type of information should be compiled and organized such that it is easy to locate and understand.

A summary description of the site's groundwater monitoring network should also be provided. This summary should state the various monitoring objectives (e.g., RCRA hazardous waste management unit detection monitoring, environmental surveillance monitoring, or DOE Order 435.1 monitoring) and should describe the network established to meet these objectives. A series of tables could be used to summarize the number of active wells by area of the site and by purpose. They should address the number of wells installed or abandoned during the current year, and any unique or innovative techniques employed in the site's groundwater monitoring network. A suggested tabular format which provides summary information on a site’s groundwater monitoring network is depicted in **Attachment IV**. Site-specific examples from the 2004 Hanford ASER are referenced in **Attachment VI**.

Aerial photographs and/or maps of the reporting facility are extremely useful in depicting monitoring points. These should be included, if available, consistent with site security requirements. In particular, maps that show the migration of groundwater contaminant plumes over time should be

included, if possible. These maps should indicate the locations of the plumes with respect to site boundaries, lakes, rivers, aquifers, monitoring wells, drinking water wells, etc. Fold-out maps may be included.

QUALITY ASSURANCE

The ASERs should describe the measures taken to ensure the quality of radiological and non-radiological data through the implementation of a quality system for the management of environmental data as required by DOE O 414.1A (Quality Assurance). This discussion should generally validate the site's data collection and analysis programs and present summary information from participation in interlaboratory cross-check programs, listing site results and expected results. The general implications of the results of interlaboratory comparisons should be discussed along with any actions taken or needed to improve data quality.

In addition, the ASER should also discuss the extent to which the following were used:
1. The *Uniform Federal Policy (UFP) for Implementing Environmental Quality Systems*, January 2003; and, 2. The associated Draft *Uniform Federal Policy for Quality Assurance Project Plans*, August 2003. The (UFP) offers an implementation tool for meeting the requirements of DOE Order 450.1, *Environmental Protection Program,* Section 5(d)(15)(a), which calls for "*a consistent system for collecting, assessing, and documenting environmental data of known and documented quality."*

Attachment II

Suggested Formats for Radiological Dose and Release Reporting in ASERs

The tables on p.25 provide examples of formats used by EH-41 in summarizing ASER radiological dose and release data. Use of these formats by DOE sites for reporting doses, atmospheric releases and liquid effluent releases in ASERs is highly recommended. If DOE Field Offices or sites can prepare the data in these, or similar formats, it would simplify aggregation of data across DOE. EH-41 will use this information to compile *DOE Annual Summaries of Radiological Doses and Releases* reports. However, the formats in Example Tables 2 and 3 are provided to assist in the compilation of these reports for DOE-wide comparison. They should not be used solely to replace site-specific-based presentations that contain more detailed radionuclide-specific information that are relevant to describing site-specific operations. A noteworthy site-specific example from the 2004 West Valley Demonstration Project (WVDP) ASER is referenced in **Attachment VI.**

The ASER should confirm that all of the types of radionuclides released from the site have been reported. If this is true, a clear statement should be made indicating that there are no known significant discharges of radioactive constituents from the site other than those reported in the tables. Such a statement would be informative to the public and also facilitate the preparation of the *DOE Annual Summaries of Radiological Doses and Releases* reports.

In addition, based on extensive review of past ASERs, most non-routine or unplanned radiological releases typically do not significantly contribute to the overall radiological doses when compared to the doses resulting from routine DOE operations. This should also be clearly communicated in the ASER, where applicable.

Please contact Ross Natoli (EH-41; 202-586-1336; Ross.Natoli@eh.doe.gov) for additional information or guidance.

Attachment II

Example Table 1: Site X Radiological Dose Reporting Table for Calendar Year 2005

Pathway	**Dose to Maximally Exposed Individual** (mrem) (mSv)	**% of DOE 100 mrem/yr Limit**	**Estimated Population Dose** (person-rem) (person-Sv)	**Population within 80 km***	**Estimated Background Radiation Population Dose** (person-rem)
Air			Average dose X population exposed	*	Pathway specific Background doses need not be estimated
Water			"	*	"
Other Pathways			"	*	"
All Pathways	{Note: This should be the total dose to the MEI, but it should not be the sum of the individual pathway doses unless all the pathway-specific MEI doses are to the same receptor}		{Note: This should normally be the sum of the average pathway-specific Population Doses}		

***** Pathway-specific populations should only be specified if they are significantly different from the total population.

Example Table 2: Site X Radiological Atmospheric Releases for Calendar Year 2005 (in Curies) **

Tritium	**^{85}Kr**	**Noble Gases ($T_{1/2}$ <40 days)**	**Short-Lived Fission and Activation Products ($T_{1/2}$ <3 hr)**	**Fission and Activation Products ($T_{1/2}$ >3 hr)**	**Total Radio-iodine**	**Total Radio-strontium**	**Total Uranium**	**Plutonium**	**Other Actinides**	**Other**

Example Table 3: Site X Liquid Effluent Releases of Radioactive Material for Calendar Year 2005 (in Curies)**

Tritium	**Fission and Activation Products ($T_{1/2}$>3hr)**	**Total Radio-iodine**	**Total Radio-strontium**	**Total Uranium**	**Total Plutonium**	**Other Actinides**

****** These example tables are to assist in DOE-wide comparisons, and if used, should be presented along with more detailed site-specific based tables. They should not replace more informative site-specific reporting formats.

Attachment III

Addressing Protection of Biota in ASERs

Guidance for Demonstrating and Reporting Compliance with Dose Limits for Biota

Dose Limits for Protection of Biota

Since 1990, Order DOE 5400.5, *Radiation Protection of the Public and the Environment*, has required that populations of aquatic organisms be protected using a dose limit of 1 rad/day. While there are no formal DOE dose limits for terrestrial biota (e.g., as proposed in 10 CFR Part 834 but not currently in the DOE Orders), it is strongly recommended that ASERs demonstrate that DOE site activities are also meeting the DOE and internationally recommended dose limits for terrestrial biota.

DOE activities should demonstrate and document in the ASER, as appropriate to each site, that:

(1) the absorbed dose to aquatic animals will not exceed 1 rad/day (10 mGy/day) from exposure to radiation or radioactive material;

(2) the absorbed dose to terrestrial plants will not exceed 1 rad/day (10 mGy/day) from exposure to radiation or radioactive material; and

(2) the absorbed dose to terrestrial animals will not exceed 0.1 rad/day (1 mGy/day) from exposure to radiation or radioactive material.

The screening and analysis methods described below provide a means of demonstrating that the above dose rate guidelines for aquatic and terrestrial biota are being achieved.

A Graded Approach for Demonstration of Protection

The DOE Technical Standard, *A Graded Approach for Evaluating Radiation Doses to Aquatic and Terrestrial Biota* (DOE-STD-1153-2002), provides practical screening and analysis methods for demonstrating compliance with the requirements for protection of biota. The Technical Standard provides a graded approach for demonstrating compliance with the biota dose limits and for conducting ecological assessments of radiological impact. The Technical Standard was developed by DOE through the Department's Biota Dose Assessment Committee (BDAC).

The graded approach consists of a three-step process which guides the user from an initial, prudently conservative set of screening values to, if needed, a more rigorous analysis using site-specific information. This process includes *data assembly*, a *general screening phase*, and an *analysis phase*. In *data assembly*, the site area to be evaluated is defined, and measured maximum or mean radionuclide concentration data are assembled for subsequent screening. In the *general screening phase*, measured radionuclide concentrations in environmental media are compared with the Biota Concentration Guides (BCGs). Each radionuclide-specific BCG represents the limiting radionuclide

concentration in environmental media which would not cause the biota dose limits to be exceeded. The *analysis phase* consists of three increasingly more detailed steps of analysis: a site-specific screening, using site-representative parameters instead of default parameters; a site-specific analysis, employing a kinetic modeling tool; and if necessary a site-specific biota dose assessment involving the collection and analysis of biota employing ecological risk assessment protocols. This three-phased scheme helps to ensure that the evaluation effort is commensurate with the likelihood and severity of potential environmental impacts. Implementation experience at DOE sites to date suggests that the majority of sites will likely be able to demonstrate compliance with biota dose limits using the general screening phase.

The RESRAD-BIOTA Code as a Tool for Evaluating Doses to Biota

The RESRAD-BIOTA code (first released in September 2003; User's Guide in January 2004; updated version 1.2 in March 2006) is the preferred companion software tool for implementing the methods contained in Technical Standard DOE-STD-1153-2002 and demonstrating protection of biota in your ASERS. The code provides a complete spectrum of analysis capabilities, from methods for general screening, to comprehensive receptor-specific dose estimation. The code contains many advanced features such as: sensitivity analysis for studying parameter sensitivity; text reports and graphing capabilities for easy interpretation of data; an advanced "Organism Wizard" for configuring user-defined organisms; and capabilities to save and retrieve evaluation data and user-defined organisms.

The Technical Standard, the RESRAD-BIOTA Code, and the RESRAD-BIOTA User's Guide (DOE/EH-0676; ISCORS Report 2004-02) can be downloaded from the BDAC web site at http://homer.ornl.gov/oepa/public/bdac. BDAC members are also available to provide technical assistance in the application of the DOE Technical Standard, or for consultation in conducting site-specific biota dose assessments where needed. The DOE Technical Standard and the RESRAD-BIOTA code are the preferred tools for estimating and evaluating doses to biota, unless there are site-specific requirements that necessitate the use of an alternative method or model, or it is determined that such alternate approaches will provide better results.

Specific Guidance and Sample Reporting Format for ASERs

Compliance with biota dose limits should be reported in the *Environmental Surveillance* section of the ASER under *Aquatic and Terrestrial Wildlife*, or comparable section. EH-41's recommended approach is to prepare a summary section of text and to incorporate a supporting summary table for the evaluations conducted. The following elements should be included in your reporting of evaluations and conclusions to demonstrate compliance with DOE biota protection requirements: (a) reference the biota dose limits being met (e.g., 1 rad/day per Order DOE 5400.5); (b) identify the method used to demonstrate compliance with these limits, and briefly describe the process used (e.g., screening methods using DOE Technical Standard DOE-STD-1153-2002 and the RESRAD-BIOTA code, or other site-selected method); (c) describe the site areas evaluated and supporting data used in the evaluation (e.g., sources of exposure to biota for the site area evaluated, specific organism types or

receptors used, media type and radionuclide concentration data used); (d) summarize the results (e.g., concentrations of radionuclides in environmental media are less than screening values, doses calculated are less than biota dose limits); and (e) provide a conclusion (e.g., populations of biota are protected at recommended dose limits and no impacts from ionizing radiation to populations of biota are indicated).

Additionally, the following areas should be highlighted as appropriate and beneficial: (a) any significant site outreach efforts or initiatives with stakeholders and local regulators; (b) integration of biota dose evaluation within your environmental surveillance program; and (c) site recognition of biota protection as a good business practice and as an important element of environmental stewardship. Refer to Module 1, Section 8, *Documenting Your Biota Dose Evaluation Results*, in DOE Technical Standard DOE-STD-1153-2002 for additional guidance.

Examples of Biota Dose Evaluation Reporting Cited from Actual ASERS

Most sites have done a good job in communicating their biota dose evaluation results in their ASERs. The West Valley Demonstration Project (WVDP) and Pantex biota dose evaluation summaries, as presented in their CY2004 ASERs, along with the Idaho National Engineering and Environmental Laboratory (INEEL) biota dose evaluation summary as presented in it's CY2003 ASER, are referenced in **Attachment VI** as noteworthy examples of how to present and summarize this information in your ASER. Please contact Stephen Domotor (EH-41; 202-586-0871; Stephen.Domotor@eh.doe.gov) for additional information or guidance.

Attachment IV

Suggested Reporting Format for DOE Site -Wide Groundwater Monitoring Program

Summary of DOE Site-Wide Groundwater Monitoring Program

The summary table on p.30, provides an example of a highly recommended format that sites should use to give an accounting of all active groundwater monitoring wells at the site. Active wells are those that are currently being used (i.e., samples are taken during the current calendar year). This summary table only includes monitoring wells. It does not include injection wells, production wells, extraction wells (e.g., for remediation), piezometers, drainage wells, etc., unless a sample is withdrawn for chemical, physical, radiological, etc., analysis.

This summary table is structured according to the primary purpose (or driver) for sampling the well, and includes the following broad categories:

1. Restoration - wells that are associated with a groundwater remediation project, including subsurface investigation monitoring, and evaluation of the progress of the remediation;

2. Waste management - wells that are sampled to determine the impact, if any, of a waste management unit (RCRA hazardous waste, DOE low-level radioactive waste, other RCRA waste, CERCLA remediation waste, etc.) on the groundwater;

3. Surveillance - wells that are sampled to detect possible impact of any other site operations (non-waste management units) on the groundwater and would include both radiological and non-radiological sampling data;

4. Other - wells sampled for any other purpose.

This example summary table accounts for numbers of samples taken during the calendar year at wells included in each of the four categories (e.g., wells used for remediation, waste management, etc.). It also accounts for analyses performed during the calendar year for all samples taken at each group of wells, corresponding to the same four categories. The summary table includes the percentage of all analyses performed where the results are below the levels of detection. The final section of the summary table includes information on the ranges of concentrations for the most commonly detected contaminants. Site-specific examples from the 2004 Hanford ASER are referenced in **Attachment VI**.

Please contact Colleen Ostrowski (EH-41; 202-586-4997; Colleen.Ostrowski@eh.doe.gov) for additional information or guidance.

Attachment IV

SUMMARY OF CY 2005 DOE SITE -WIDE GROUNDWATER MONITORING PROGRAM*

	PURPOSES FOR WHICH MONITORING WAS PERFORMED			
	Remediation	**Waste Management**	**Environmental Surveillance**	**Other Drivers**
Number of Active Wells Monitored				
Number of Samples Taken				
Number of Analyses Performed				
% of Analyses that are Non-Detects				
Ranges of Results for Positive Detections				
Tritium				
Krypton-85				
TCE				
Heavy Metals				
VOCs				
Other Contaminants (list separately)				

***** Sites should specifically indicate the total number of active groundwater wells monitored on-site and the total number of active groundwater wells monitored off-site. Where appropriate, a second table could be included in this section to characterize off-site groundwater monitoring.

Attachment V

ASER Reporting and Closure Sites

This section is intended to provide suggestions and guidance to DOE sites whose primary mission is environmental restoration with a goal of closure in the near future and sites managed by the DOE Office of Legacy Management (LM). EH-41 recognizes the unique nature and diversity of many LM managed sites makes them suitable candidates for alternate forms of ASERs. Some alternatives to preparing the traditional ASER may be available to these sites given their mission, current operation status, and desire to streamline DOE internal reporting requirements and avoid redundancy in reporting. These alternatives may include either preparing a scaled-down version of the ASER or submitting equivalent documentation to DOE-HQ along with a self-declaration from the site that this documentation satisfies DOE internal reporting requirements.

The purpose of the ASER is to characterize site environmental management performance, summarize environmental occurrences and responses reported during the calendar year, confirm compliance with environmental standards and requirements, and highlight significant site programs and efforts. ASERs can also serve as a vehicle to document a site's progress in implementing Environmental Management Systems (EMS) within the framework of the Department's Integrated Safety Management System (ISMS). DOE Order 450.1, *Environmental Protection Program*, requires DOE sites to have an EMS in place by December 31, 2005. The status of a site's EMS implementation should be reported in the ASER.

ASERs provide information that is essential to DOE Headquarters (DOE-HQ) in order to assess field environmental program performance and to confirm compliance with regulatory environmental standards and requirements. ASERs are often used by DOE-HQ to gather site-specific environmental program performance information, to report DOE's environmental performance to Congress and the Environmental Protection Agency, and to respond to external inquiries. They are also the means by which DOE demonstrates compliance with DOE internal standards and requirements such as the radiation protection requirements of Order DOE 5400.5, *Radiation Protection of the Public and the Environment*. In addition, ASERs are an important means of conveying DOE's environmental performance to members of the public living near DOE sites and to other stakeholders, as well.

Some DOE sites may consider preparing a scaled-down, streamlined version of the ASER that reflects the current nature and extent of site operations and monitoring programs. Sites nearing closure may be in a relatively static operational condition. The scaled-down ASER may summarize any relevant new information for the current year and appropriately reference the previous year's ASER for a description of unchanged or static conditions at the site. DOE Order 231.1A and annual ASER guidance allow for sites to use a graded approach and to tailor their ASERs considering the site mission, breadth of operations, and the potential impact site activities may have on the public and environment proximate to the site.

A second option is to submit the relevant and equivalent regulatory environmental compliance and radiological protection documentation to DOE-HQ in lieu of preparing the traditional ASER. For example, National Emission Standards for Hazardous Air Pollutants, National Pollutant Discharge Elimination System, and other regulatory environmental reporting that may be required and appropriate to your site, may be submitted. This documentation should characterize the site's environmental monitoring program and results, site activities, regulatory compliance status and compliance with Order DOE 5400.5. This equivalent documentation should be submitted to the Office of Environment, Safety and Health via a transmittal memorandum from the Site Manager or Field Office Manager by October 1 of each calendar year. This memorandum should state that the site is self-declaring compliance with the radiation protection requirements of Order DOE 5400.5, and that the associated documentation that is forwarded with this memorandum supports this self-declaration. This alternate approach should demonstrate compliance with the spirit of the environmental protection reporting requirements of DOE Order 231.1A and the annual guidance issued to field elements regarding the preparation of ASERs.

Regardless of the option certain sites may choose to pursue, appropriate measures should be taken to effectively communicate the site's environmental status with DOE-HQ and the public in the future. Specifically, sites should identify the future mechanisms that will be used to keep the public informed of site activities, closure progress, environmental activities and monitoring results. At the appropriate juncture in the future, when environmental restoration activities are concluded at the site, the final submittal of appropriate documentation to DOE-HQ should describe the close-out condition of the site, including such information as the nature and extent of final activities at the site, the status of the present and future monitoring and surveillance programs, and any pertinent institutional controls that may be implemented at the site.

Please contact Ross Natoli (EH-41; 202-586-1336; Ross.Natoli@eh.doe.gov) for additional information or guidance.

Attachment VI

Site -Specific Examples of Suggested ASER Reporting Formats

Attachment VI provides examples of model reporting formats referenced from 2004 ASERs. These examples provide suggested reporting options for sites to consider for incorporation into their respective ASERs, as appropriate. They include reporting formats for: the executive summary, radiological doses and releases, biota dose evaluations, a site-wide groundwater monitoring program summary, Environmental Management Systems, DOE Order 450.1, ISMS/EMS integration, E.O. 13101, E.O. 13148, Emergency Planning and Community Right-To-Know (EPCRA), environmental performance measures, National Pollutant Discharge Elimination System (NPDES) exceedances and the ASER public/reader comment form. Please contact Ross Natoli (EH-41; 202-586-1336; Ross.Natoli@eh.doe.gov) for additional information or guidance.

Internet addresses are provided below to access the ASERs directly:

1. **Executive Summary:**
   Nevada Test Site – http://www.nv.doe.gov/library/publications/environmental.aspx

2. **Radiological Doses and Releases:**
   West Valley Demonstration Project - http://www.wv.doe.gov

3. **Biota Dose Evaluations:**
   West Valley Demonstration Project - http://www.wv.doe.gov
   Pantex - http://www.pantex./aser/
   Idaho National Engineering and Environmental Laboratory (2003) –
   http://www.stoller-eser.com/publications.htm

4. **Site-Wide Groundwater Monitoring Program Summary Tables:**
   Hanford - http://hanford-site.pnl.gov/envreport

5. **Environmental Management System:**
   Brookhaven National Laboratory – http://www.bnl.gov/esd/SER.asp

6. **DOE Order 450.1 and ISMS/EMS Integration:**
   Los Alamos National Laboratory - http://www.airquality.lanl.gov/pdf/ESR/LA-14239-ENV.pdf
   Oak Ridge National Laboratory - http://www.ornl.gov.aser

7. **E.O. 13148 and E.O. 13101 Reporting:**
   Jefferson Lab - http://www.jlab.org

8. **EPCRA Reporting:**
   Lawrence Livermore National Laboratory - http://anl.gov/ESH/anleser

Attachment VI

Site -Specific Examples of Suggested ASER Reporting Formats (cont.)

9. **Environmental Performance Measures:**
   Argonne National Laboratory-East - http://www.llnl.gov/saer/index.html
   West Valley Demonstration Project - http://www.wv.doe.gov

10. **NPDES Exceedances:**
    Oak Ridge National Laboratory - http://www.ornl.gov.aser
    Savannah River Site - http://www.srs.gov/general/pubs/ERsum/index.html

11. **ASER Public/Reader Comment Form:**
    Savannah River Site - http://www.srs.gov/general/pubs/ERsum/index.html
    Pantex - http://www.pantex./aser/